STEAM ENGINES AND BOILERS

WATERTOWN N.Y.

WATERTOWN STEAM ENGINE COMPANY

WATERTOWN, Tel. 5429 Cort.

THIS . CATALOGUE . CONTAINS . ONLY . A PARTIAL . LIST . OF . THE . MACHINERY . BUILT BY . US. IN . ADDITION . TO . THE . ENGINES . AND BOILERS . HERE . DESCRIBED . WE . BUILD . ALSO:

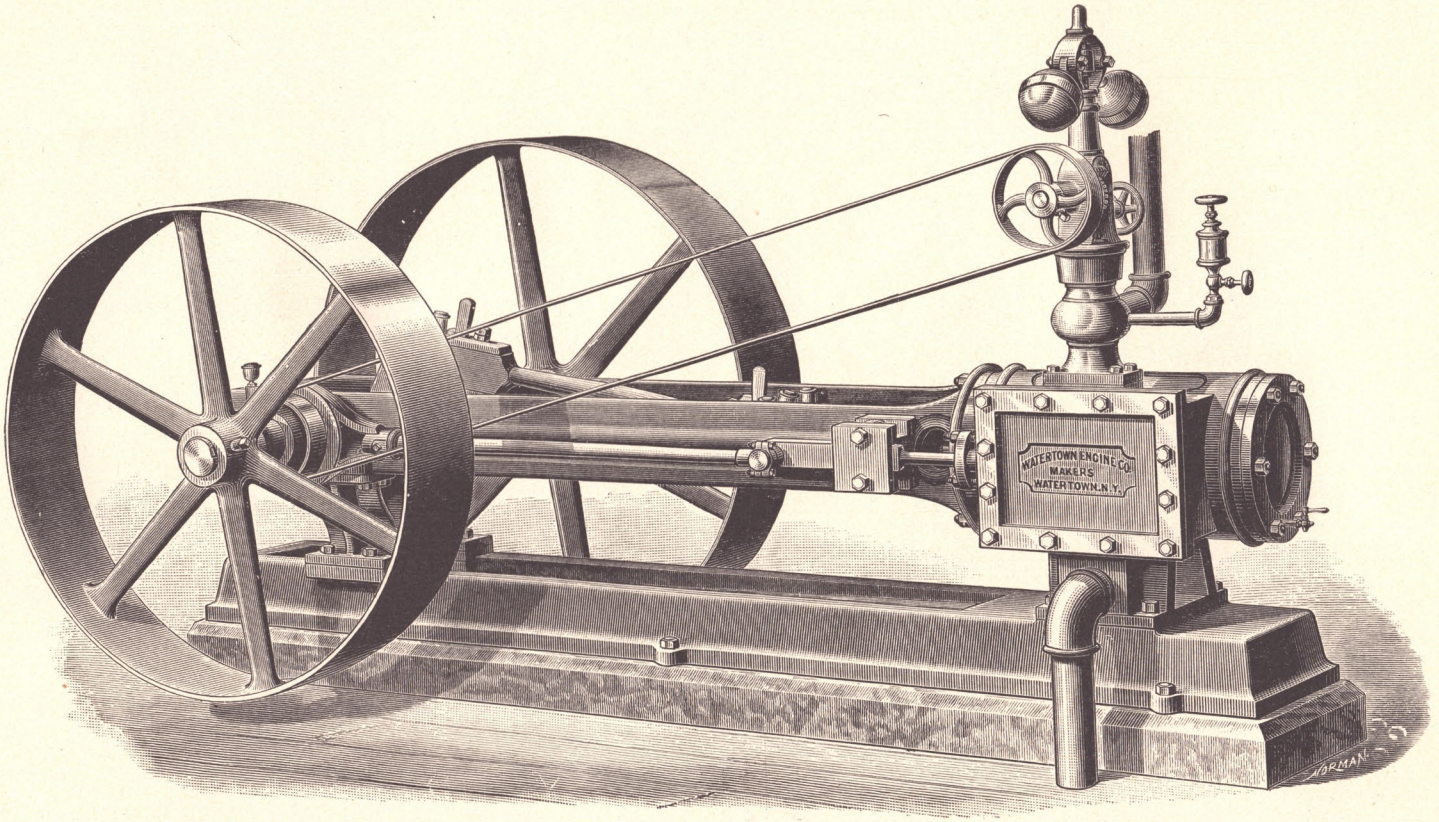
High Speed Automatic Engines—Designed more especially for Electric service. They are described in our Special Catalogue of Automatic Engines, which we shall be glad to send on request.

Slow Speed Automatic Engines. These are used mainly for Factory purposes. They are guaranteed to equal the best Automatic Engines in the market. Described in Special Catalogue.

Compound and Triple Expansion Engines. We have a large variety of patterns, and are prepared to build Engines to meet the most exacting requirements. Catalogue, specifications and plans will be furnished on request.

High Pressure or Heavy Duty Boilers. We are making a specialty of Boilers of very heavy construction, intended to carry high pressures made necessary by modern engineering, and particularly by compound and expansion Engines. These Boilers are made in a variety of styles, and are fully described in special catalogues, which we should be glad to send on application.

Watertown Steam Engine Co.,
New York Office,
39 Cortlandt Street.

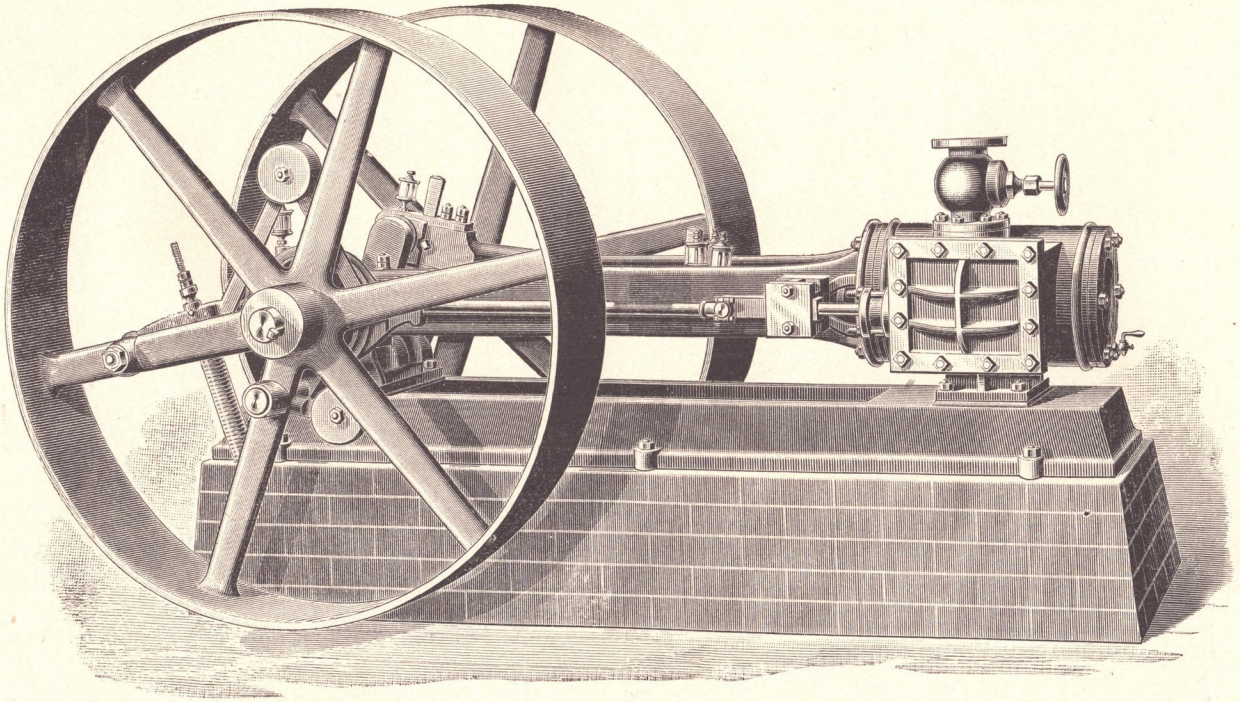

WATERTOWN ENGINE CO.
MAKERS
WATERTOWN, N.Y.

THE EXCELSIOR STRAIGHT LINE ENGINE.

DIMENSIONS.

Number	1	2	3	4	5	6	7	8	11	14	16	18	20	22	24
Horse Power	4	5	6	7	8	10	12	15	20	25	35	45	50	60	70
Diameter of Cylinder....inches	4	5	5	5½	6	6½	7	8	9	10	11	12	13	14	15
Length of Stroke.....inches	6	6	8	9	9	10	10	12	12	14	14	14	16	16	16
Diameter Fly Wheel.....inches	26	30	30	36	36	40	44	48	54	60	60	66	66	72	72
Width Face Fly Wheel...inches	4	6	6	8	8	8	8	12	12	12	12	13	13	14	14
Diameter Band Wheel...inches	16	20	20	24	24	24	24	30	36	40	40	48	48	54	54
Width Face Band Wheel.inches	4	6	6	8	8	8	8	8	8	10	10	12	12	12	12
Revolutions per Minute.....	240	240	240	240	240	225	225	200	200	180	180	180	150	150	150
Weight.....	600	700	900	1250	1300	1700	1750	2600	2800	4200	4300	4500	7000	7500	8000

The cut represents a style of Engine specially adapted to a large variety of uses. The working parts are enclosed in a strong, substantial frame holding the bearings, guides and cylinders in a direct line. So perfectly self-contained is this Engine that it can be run almost without foundation, and there is no possibility that any part of it can get out of line. Its speed is adjustable, and the Engine is strong enough to admit of a decided increase in speed if necessary. The speed can be readily changed while the Engine is running. Price represents the Engine complete with bed plate, double crank shaft, fly wheel, pulley, automatic stop governor, throttle valve, air cocks, cylinder lubricator, all oil cups, pump and heater, and a full set of wrenches. There is no finish except on the working parts. All parts are interchangeable, and all bolts, nuts and smaller parts are standard sizes, such as can be readily obtained at any good machine shop. Ample provision is made for lubricating all bearings. Connecting rod is made of hammered iron. Piston rod, valve rod, pump rod are of steel. All boxes, cross-head bearings and other wearing parts are of composition bronze. Set-screws and nuts are case hardened, and the workmanship throughout is as good as can be found on any Engine in the market.



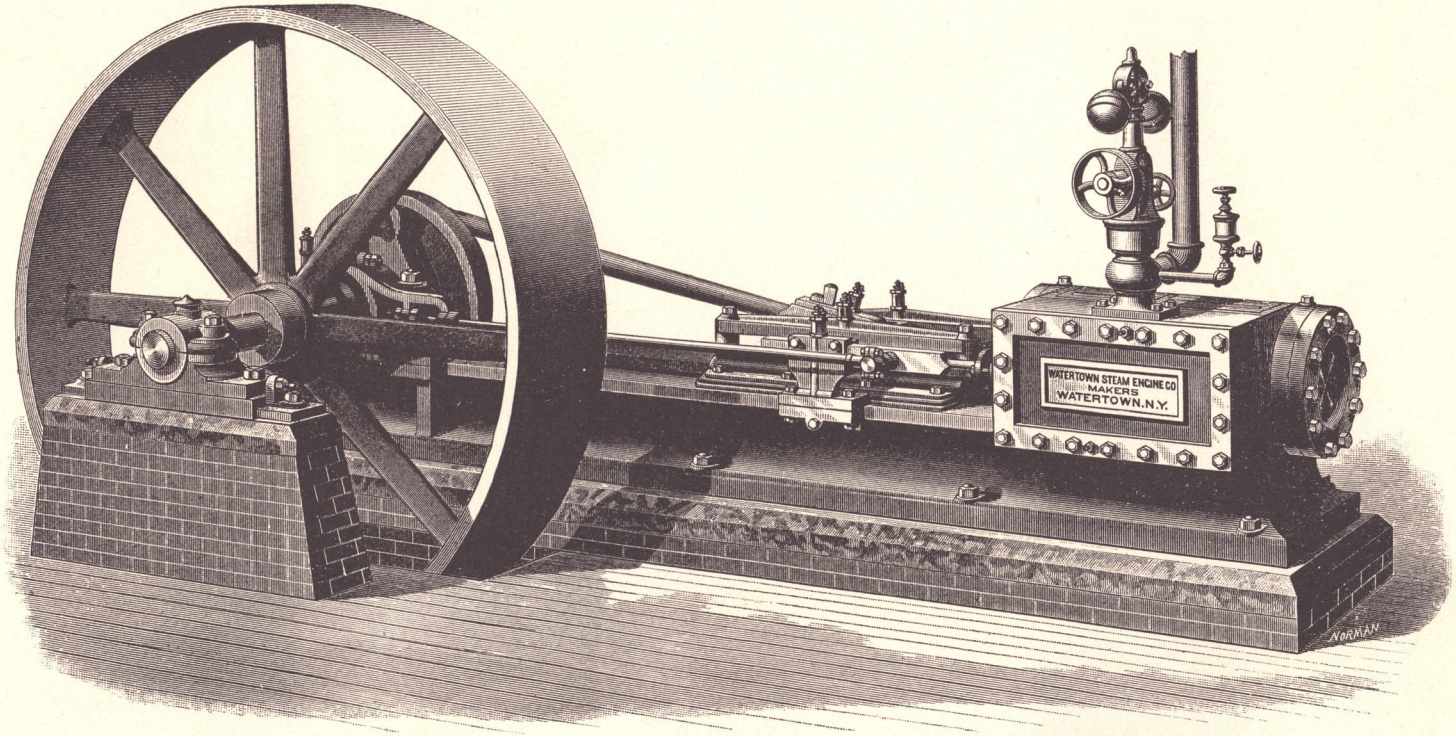
THE EXCELSIOR AUTOMATIC ENGINE.

DIMENSIONS.

Number	6	7	8	11	14	16	18	20	22	24
Diameter of Cylinder....inches	6 1/2	7	8	9	10	11	12	13	14	15
Length of Stroke.....inches	10	10	12	12	14	14	14	16	16	16
Diameter of Band Wheel, inches	40	44	54	54	60	60	66	66	72	72
Width of Face. .....inches	8	8	12	12	12	12	13	13	14	14
Diameter of Gov. Wheel, inches	40	44	54	54	60	60	66	66	72	72
Width of Face.....inches	8	8	12	12	12	12	12	12	14	14
Diameter of Main Shaft, inches	2 7/16	2 7/16	3 1/8	3 1/8	3 7/8	3 7/8	3 7/8	3 7/8	4 13/16	4 13/16
Diameter of Crank Pin, inches	2 7/16	2 7/16	3 1/8	3 1/8	3 7/8	3 7/8	3 7/8	3 7/8	4 13/16	4 13/16
Diameter of Steam Pipe, inches	1 1/2	1 1/2	2	2	2 1/2	2 1/2	3	3 1/2	4	4
Floor Space required, length...	84	88	100	102	116	116	120	132	132	132
Floor Space required, width....	48	50	54	54	66	66	72	80	80	80
Nominal or Rated Horse Power	10	12	15	20	30	40	50	55	60	75
Indicated H. P. cutting off at 1/4 with 80 pounds initial pressure, and revolutions 150	.....	.....	.....	.....	.....	..	...	60.	73.1	84.4
175	.....	.....	.....	.....	31.3	39.2	53.6	69.2	86.5	99.8
200	.....	.....	19.4	25.8	36.8	45.	62.	75.	99.2	113.5
225	13.6	15.4	22.2	28.	42.2	51.3	70.2	.....	.....	.....
250	15.2	17.	25.5	32.3	.....	.....	.....	.....	.....	.....
275	17.	19.2	.....	.....	.....	.....	.....	.....	.....	.....
Shipping Weight, lbs.....	1800	2000	2600	2800	4800	5000	5800	7500	8000	8800

We have recently added to our well known Excelsior Engine a fly-wheel governor of simple design, thereby adapting the Engine to meet the demand for a strong, simple Automatic Engine at moderate cost.

For small powers, where close regulation for electric lighting and similar purposes and economy of fuel are important, it will be found valuable.

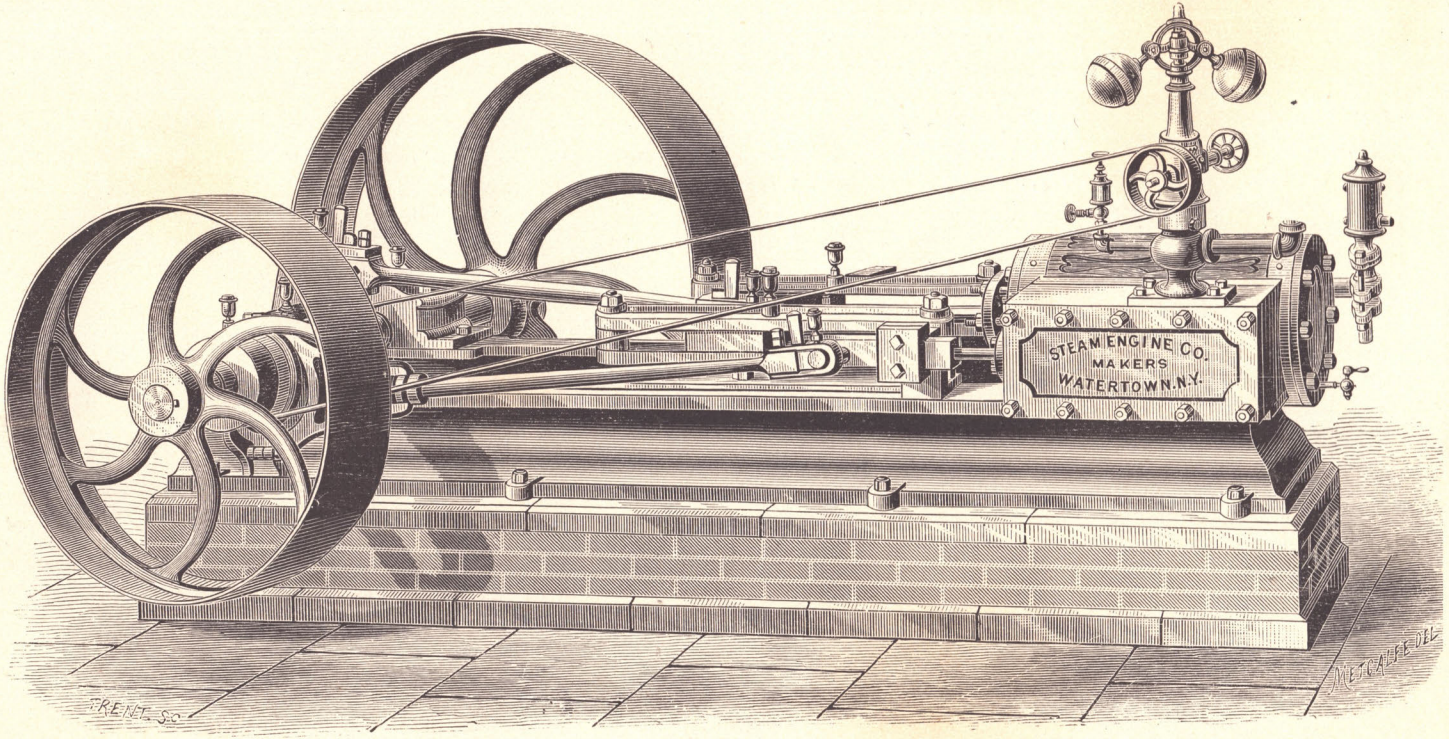

WATERTOWN STEAM ENGINE CO
MAKERS
WATERTOWN, N.Y.
NORMAN

THE HEAVY DUTY STATIONARY ENGINE.

DIMENSIONS.

Number	10	12	15	20	25	30	40	50	60	80	100	150
Horse Power	15	20	25	30	40	50	65	75	100	125	175	225
Diameter of Cylinder....inches	8	8½	9	10	11	12	14	15	16	18	20	22
Length of Stroke....inches	14	16	18	20	20	20	24	24	28	28	32	32
Diameter of Fly Wheel....inches	54	54	60	72	84	84	100	100	120	120	144	144
Width of Face of Fly Wheel....inches	10	10	12	14	14	14	18	18	20	20	24	24
Revolutions per Minute	145	140	135	130	130	130	120	120	110	110	95	95
Weight	2800	3600	4000	5700	6200	6500	12500	14000	17000	18000	20000	21000

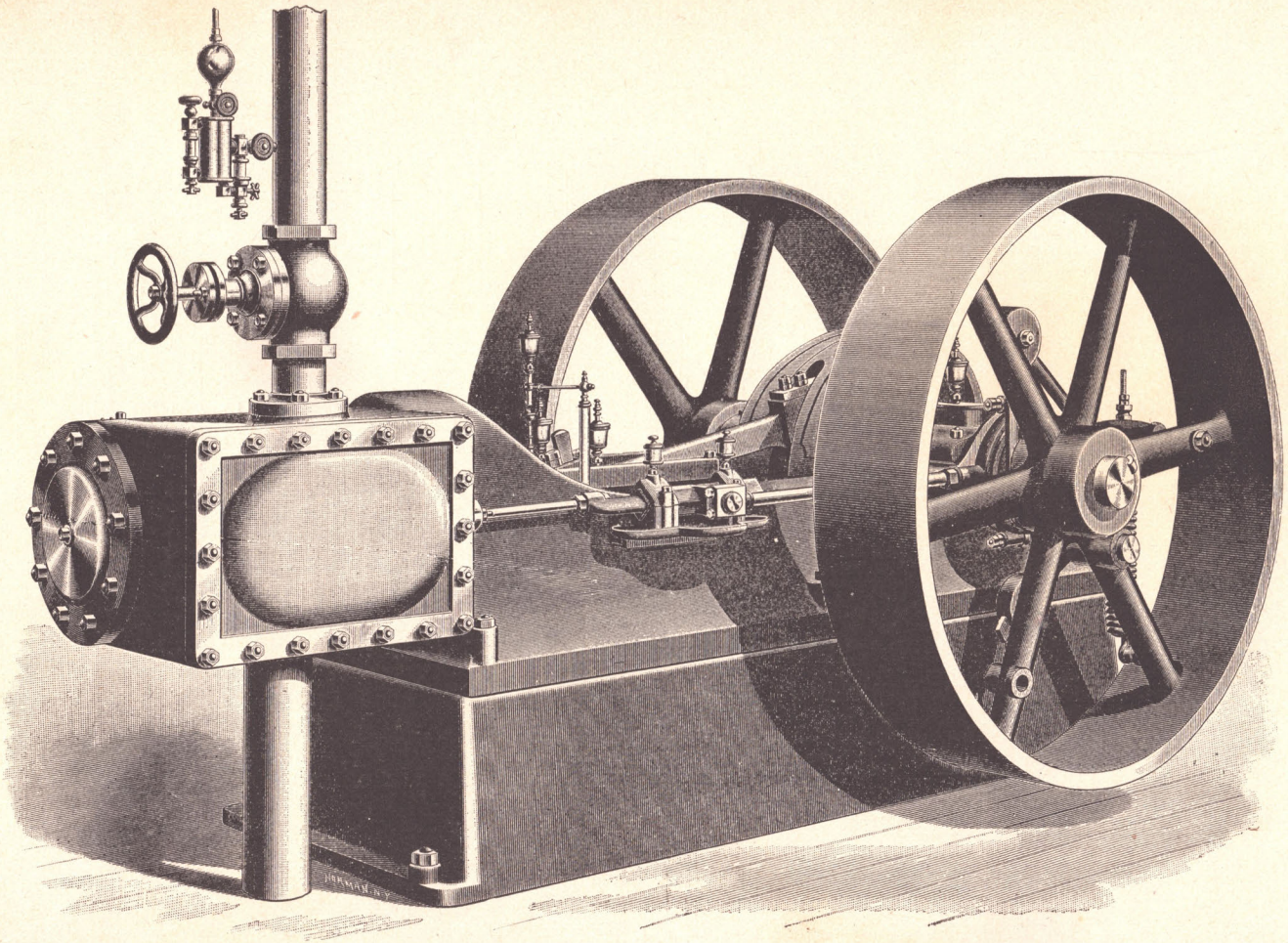
We furnish with this Engine, shaft, drive wheel, outer bearing, governor, throttle valve, cylinder, lubricator, and complete set of oil cups, air cocks and wrenches. Cross-head pump and heater are furnished with No. 30 and smaller. On No. 40 and larger these parts are not included. On all engines above No. 20 a square rim drive wheel will be furnished if preferred, or the regular drive-wheel will be exchanged for one of different dimensions, but of equal weight. The speed given in the table is not fixed, but is subject to adjustment by means of the governor. The Engine shown in the engraving is left hand. It can be made right hand if desired. It can also be made Center Crank. It will be observed that this Engine is very heavy and substantial. It is designed for heavy work. Material used is of the best quality, and great care is taken with the workmanship in every part.


STEAM ENGINE CO.
MAKERS
WATERTOWN, N.Y.

THE CENTER CRANK ENGINE.

Number	10	12	15	20	25	30	40	50	60	80
Horse Power	15	20	25	30	40	50	65	75	100	125
Diameter of Cylinder....inches	8	8½	9	10	11	12	14	15	16	18
Length of Stroke....inches	14	16	18	20	20	20	24	24	28	28
Diameter of Fly Wheel....inches	48	54	60	72	72	72	84	84	100	100
Width Face of Fly Wheel..inches	12	12	12	14	14	14	18	18	20	20
Diameter of Band Wheel....inches	30	36	40	48	48	48	60	60	60	60
Width Face of Band Wheel, inches	8	8	10	12	12	12	12	12	12	12
Revolutions per Minute	145	140	135	130	130	130	120	120	110	110
Weight	3000	4000	4500	6200	6800	7200	14000	15000	18000	20000

The above cut represents a style of Engine identical with the one described on page 6, except that it is furnished with double crank and two wheels instead of one. This will be found an advantage where it is desirable to drive two machines at once without the use of a line shaft. We build this Engine of all the sizes named on page 7, up to and including No. 80. It is identical as regards parts furnished and dimensions with the side crank Engine, except that it is not supplied with an outer pillow block, but has instead an additional pulley, which may be of size to suit the requirements of the customer. In other respects it corresponds entirely with the Engine previously described.



THE HIGH SPEED SINGLE CYLINDER ENGINE.

Diameter Cylinder.....	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Stroke.....	10	10	12	12	14	14	16	16	18	18	20	20	22	22
Diameter Pulleys.....	40	40	54	54	60	60	66	66	72	72	78	78	84	84
Face Pulleys.....	10	10	11	11	12	12	14	14	16	16	17	17	19	19
Length Floor Space. in.	89	89	112	112	125	125	138	138	178	178	194	194	215	215
Width Floor Space.. in.	49	49	53	53	66	66	76	76	85	85	90	90	98	98
Length Bearing..... in.	8	8	10	10	12	12	14	14	16	16	18	18	20	20
Weight.....	3500	3800	4500	5000	7700	8300	11000	12000	16000	17500	21000	23000	27000	29000
Weight Base.....	900	900	1200	1200	1700	1700	2000	2000	2400	2400	3000	3000	3300	3300
Estimated Horse Power	35	50	60	70	80	100	120	140	160	180	200	250	300	350

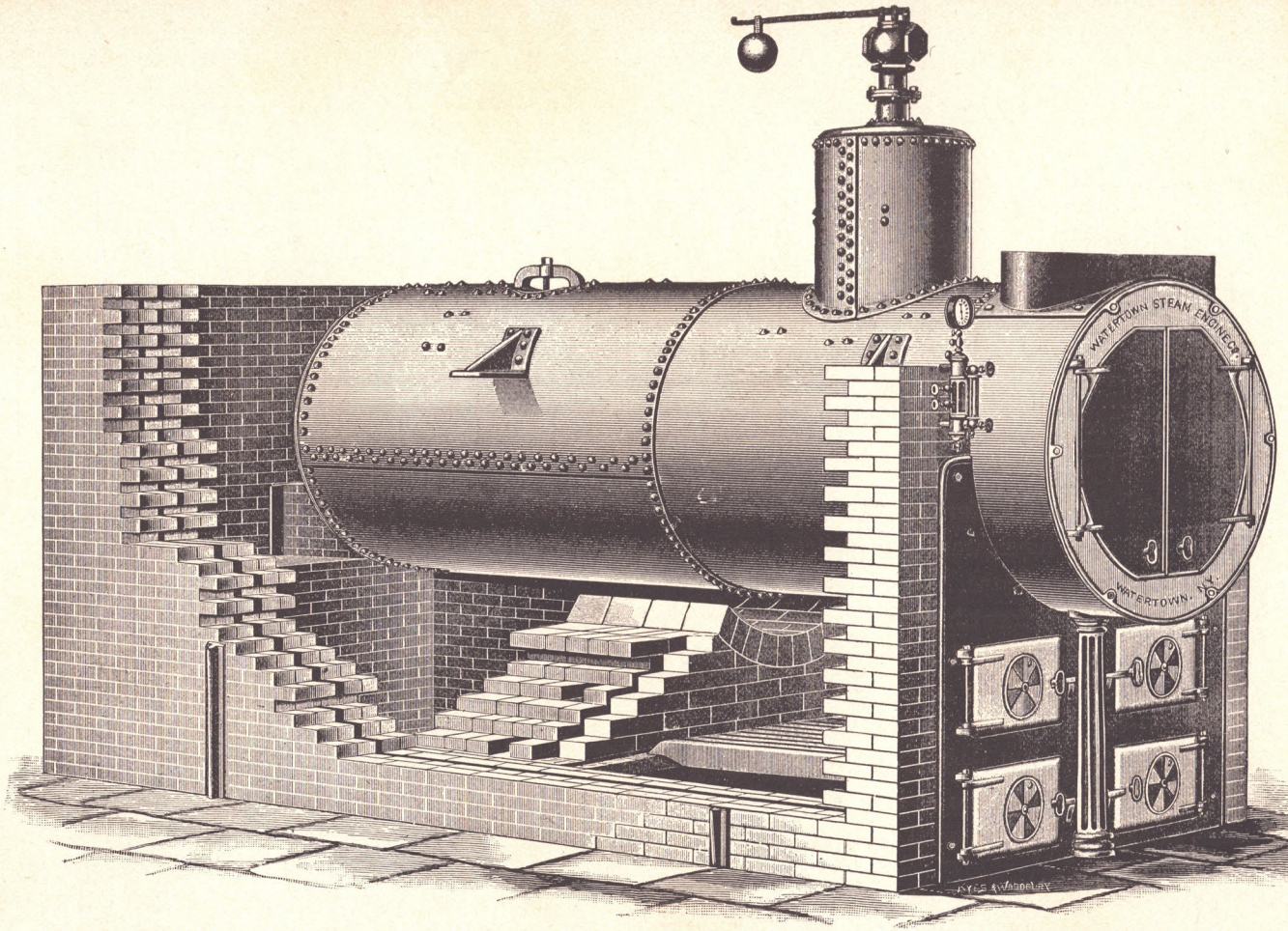
With each Engine is furnished a full set of foundation bolts and anchor plates, a throttle valve, a sight feed cylinder lubricator, a complete set of sight feed oil cups, wrenches, all necessary drip pipes with valves and connections.

When desired, we furnish with the Engine at a moderate price a heavy sub base, carefully planed to receive the engine bed, which is bolted and doweled to it.

Each Engine is supplied with two heavy balance wheels. The table gives the size of wheels ordinarily furnished. Slight changes in the dimensions of wheels can be made if desired.

Speeds can be varied within the limits named.

Horse Power Ratings are at average speed and presure, and are given only as an approximate guide. For exact powers consult special tables.


WATERTOWN STEAM ENGINE CO.
WATERTOWN, N.Y.

THE RETURN TUBULAR BOILER.

This style of Boiler is too well known to require much by way of description. For the majority of purposes we recommend it as the best. It secures the greatest useful effect from the fuel consumed by the simplest possible construction.

We are prepared to furnish domes, drums or dry pipe. Unless otherwise ordered, dome will be furnished.

Unless otherwise ordered, each Boiler will be supplied with four heavy cast-iron brackets. We will furnish hooks for supporting Boiler instead of brackets, if preferred.

On each Boiler above No. 15 we furnish man-hole frame with plate, bail and gasket. Size of opening 11 x 15, cut girthwise. Unless otherwise ordered, this man-hole will be placed on the top of Boiler back of dome, as shown in cut. If preferred, it can be placed in the head of Boiler, below or above the tubes.

All Boilers are supplied with hand-hole plate and bail at the bottom of the front head.

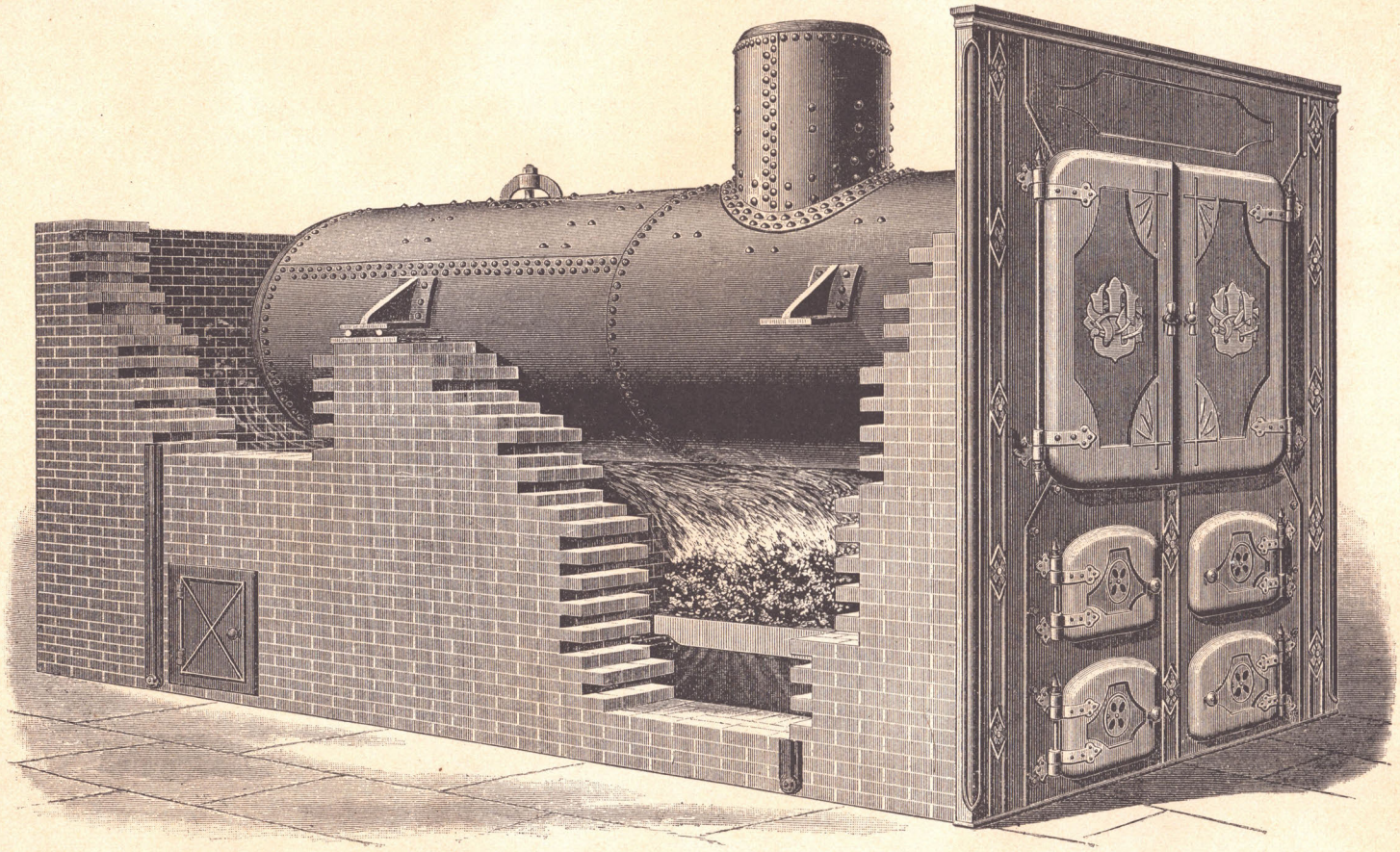
Each Boiler is supplied with large safety valve properly proportioned. For large Boilers we think there is nothing better than the standard ball and lever valve. We make, however, an excellent pop valve, which we use on our small Boilers; or we are prepared to furnish any style of safety valve in the market if desired.

With the Return Tubular Boilers the following fixtures are regularly furnished: Dome, front, brackets, arch plate, ash door and frame, smoke box and door, smoke pipe, saddle, grates, grate rest, man-hole plate and bail.

The fittings used on our Boilers are all heavy and substantial. We use only first-class gauges, cocks and valves, and attach them to the Boiler at what we believe to be the most convenient point. The fittings furnished with the Return Tubular Boiler are as follows: Safety valve, check valve, water column, steam gauge, blow-off valve, water gauge, whistle, stop valve and gauge cocks.

The price of Boiler complete includes all the above parts. If any are not wanted, specify what is not required, and the price will be deducted from the price of the Boiler. If Boiler complete is ordered, the full list will be sent.

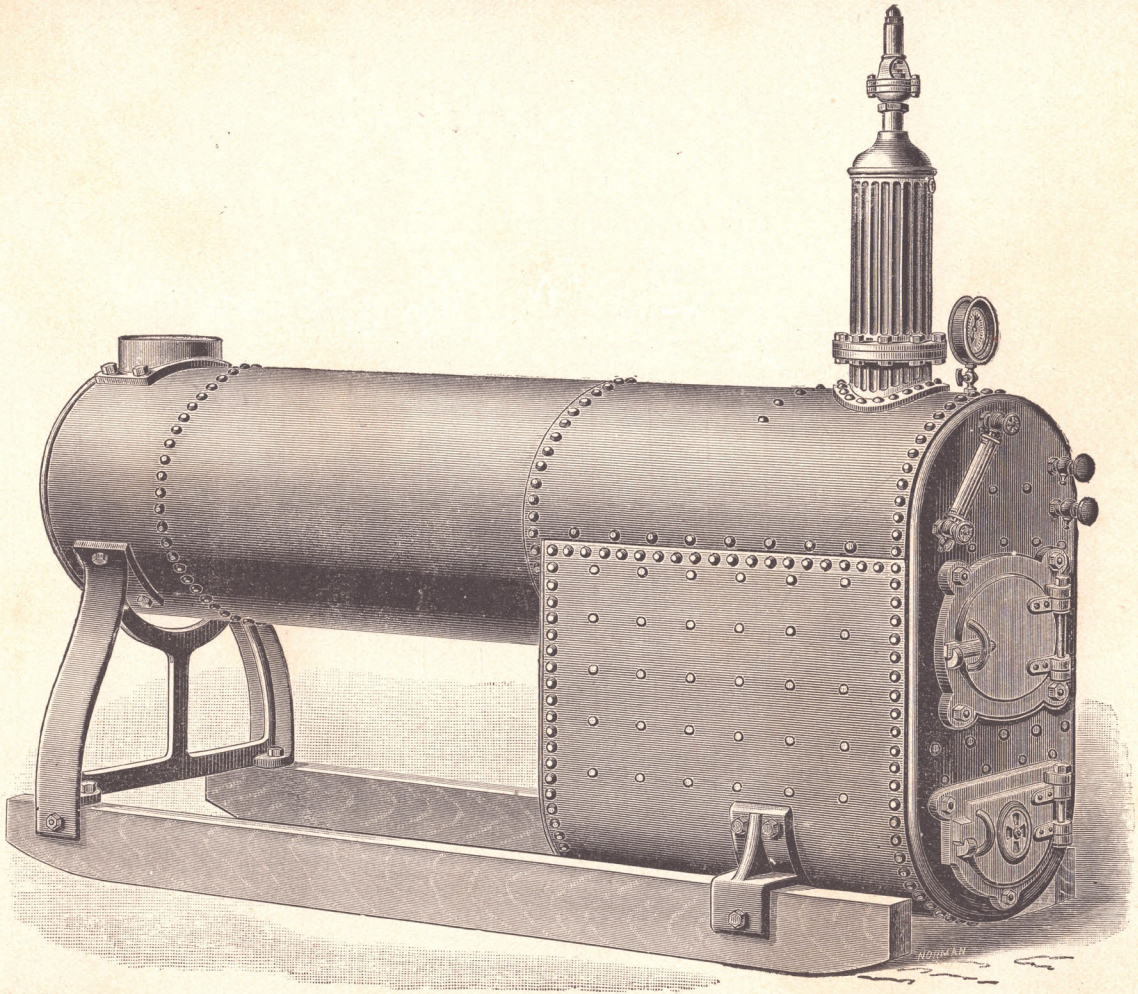
All fixtures and fittings not named in the above list will be charged as extra. Our price list gives cost of the extras more commonly called for, (such as increased lengths of smoke pipe, stack plate, damper, spark catcher, wall plates and rollers, buck stays and binding bars).



THE RETURN TUBULAR BOILER.

DIMENSIONS.

Number	10	12	15	20	25	30	35	40	50	60	70	80	90	100	110	120	150	175
Sq. ft. Heating Surface.	145	185	228	305	375	450	530	625	750	880	930	1180	1340	1436	1632	1752	2200	2510
Horse Power	10	12	15	20	25	30	35	40	50	60	70	80	90	100	110	120	150	175
Diameter (in inches)	30	30	36	36	42	44	44	48	54	54	54	60	60	66	72	72	84	84
Length of Tubes (in ft.	7	9	9	10	10	10	12	12	12	14	16	14	16	16	16	18	16	18
Number of Tubes, 2½ in.	26	26	32	32	....	....	....	....	....	....	.....	.....	.....	....	.. .	.....	....	....
" " 3 in.	20	20	30	30	40	44	44	52	70	70	70	82	82	105	120	120	150	150
" " 3½ in.	....	....	24	24	31	34	34	46	55	55	55	64	64	78	94	94	126	126
" " 4 in.	....	....	....	..	26	28	28	37	45	45	45	54	54	64	78	78	106	106
Diameter of Dome	15	15	18	18	21	22	22	24	27	27	30	30	30	33	36	36	42	42
Height of Dome.	16	16	18	18	22	24	24	28	30	30	33	33	33	36	40	40	40	40
Length of Grate	40	40	40	40	40	44	44	44	48	48	48	48	60	60	60	72	72	72
Width of Grate	27	27	33	33	39	41	41	45	51	51	51	57	57	63	66	66	78	78
Size Safety Valve	1½	2	2	2½	2½	3	3	3	3½	3½	4	4	4	4½	5	5	6	6
Diam. of Smoke Pipe.	16	16	17	17	20	20	20	22	26	26	30	30	30	32	36	36	42	42
Length of Smoke Pipe	30	30	30	30	36	36	42	42	42	48	48	48	60	60	60	60	70	70
Th'kness of Iron in Pipe	16	16	16	16	16	16	16	16	16	16	14	14	14	14	12	12	10	10
Wt. Boiler without Fixt.	1650	2050	2850	3600	3700	4000	4650	5525	7000	8200	10000	11500	13500	14500	15000	16000	18000	20000
Weight of Fixtures	2000	2000	2400	2800	3100	4500	5000	5000	5000	5000	6500	6500	6500	7500	9000	9000	10000	10000



LOCOMOTIVE BOILER.

DIMENSIONS.

Number	3	4	5	6	7	8	11	14	16	18	20	22	24
Horse Power	6	7	8	10	12	15	20	25	30	35	45	50	60
Length Fire Box....inches	30	36	36	36	36	40	49	55	55	60	60	66	66
Width Fire Box.....inches	18	20	20	22	22	26	28	30	30	30	35	40	40
Height Fire Box....inches	24	29	29	34	34	36	38	40	40	40	46	48	48
Diameter Waist .....inches	22	24	24	27	27	30	33	36	36	36	42	48	48
Number of Tubes.....	23	26	26	32	32	32	36	43	43	43	41	48	60
Diameter of Tubes....inches	2	2	2	2	2	2½	2½	2½	2½	2½	3	3	3
Length of Tubes....inches	48	48	60	60	72	78	84	84	96	108	120	120	144
Grate Surface.....	3.75	5	5	5.5	5.5	7 22	9.33	11.45	11.45	12.5	15	20	22
Size Safety Valve.....	1	1¼	1¼	1½	1½	2	2	2½	2½	2½	2½	3	3
Diameter of Smoke Pipe.....	11	13	13	14	14	16	16	20	20	20	22	24	26
Length of Smoke Pipe.....	12	18	18	18	18	18	18	18	18	18	18	24	24
Thickness Iron in Pipe	20	18	18	18	18	16	16	16	16	16	14	12	12
Space occupied, Length, feet..	8	8¾	9¾	10	11	12	13	14	15	16½	18	18	21
Space occupied, Width, inches	30	31	31	33	33	36	38	48	48	48	54	60	60
Weight	1800	2100	2400	2800	2950	3600	4500	5000	6000	7000	8000	10000	12000

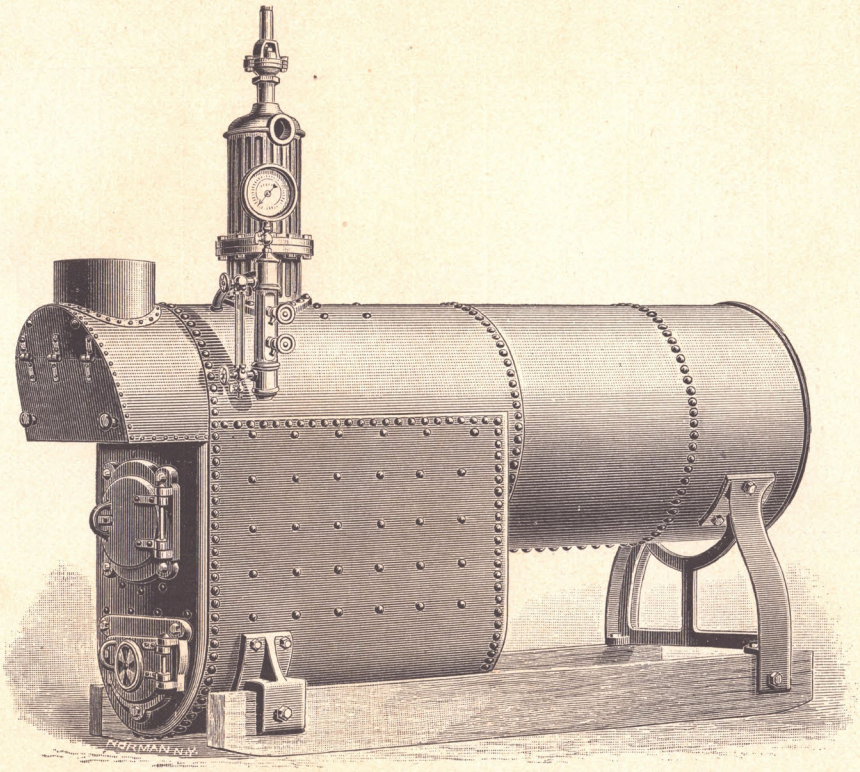
The above table gives dimensions with sizes of Locomotive Boilers commonly made by us. We are prepared to make larger sizes if necessary.

Fixtures include fronts, doors, grates, grate rest, smoke box, saddle, smoke pipe, hand hole, plate and bail.

Fittings include safety valve, water column, steam gauge, water gauge, gauge cocks, blow-off valve, check valve, stop valve, whistle and pipe.

Boilers made with wrought iron or cast iron domes, as may be preferred.

Boilers are made with circulating water bottom or with open bottom.



RETURN FLUE LOCOMOTIVE BOILER.

DIMENSIONS.

Number	3	4	5	6	8	11	14	16	18	20	22	24
Horse Power	6	7	8	10	15	20	25	30	40	50	60	80
Diameter of Waist	24	24	27	27	30	36	42	42	48	54	62	62
Length of Fire Box	27	27	33	33	36	42	42	42	48	48	60	66
Width of Fire Box	19	19	22	22	24	30	36	37	42	47	54	54
Height of Fire Box	20	20	32	32	34	36	37	39	42	48	50	50
Number of Upper Tubes	16	16	20	20	22	30	37	37	36	48	60	60
Diameter of Upper Tubes	2	2	2	2	2	2½	2½	2½	3	3	3	3
Length of Upper Tubes	48	60	60	72	78	84	78	84	96	144	168	192
Number of Lower Tubes	10	10	12	12	16	16	24	24	20	23	28	28
Diameter of Lower Tubes	2½	2½	2½	2½	2½	3	3	3	4	4	4	4
Length of Lower Tubes	19	31	24	36	39	39	44	40	48	96	114	132

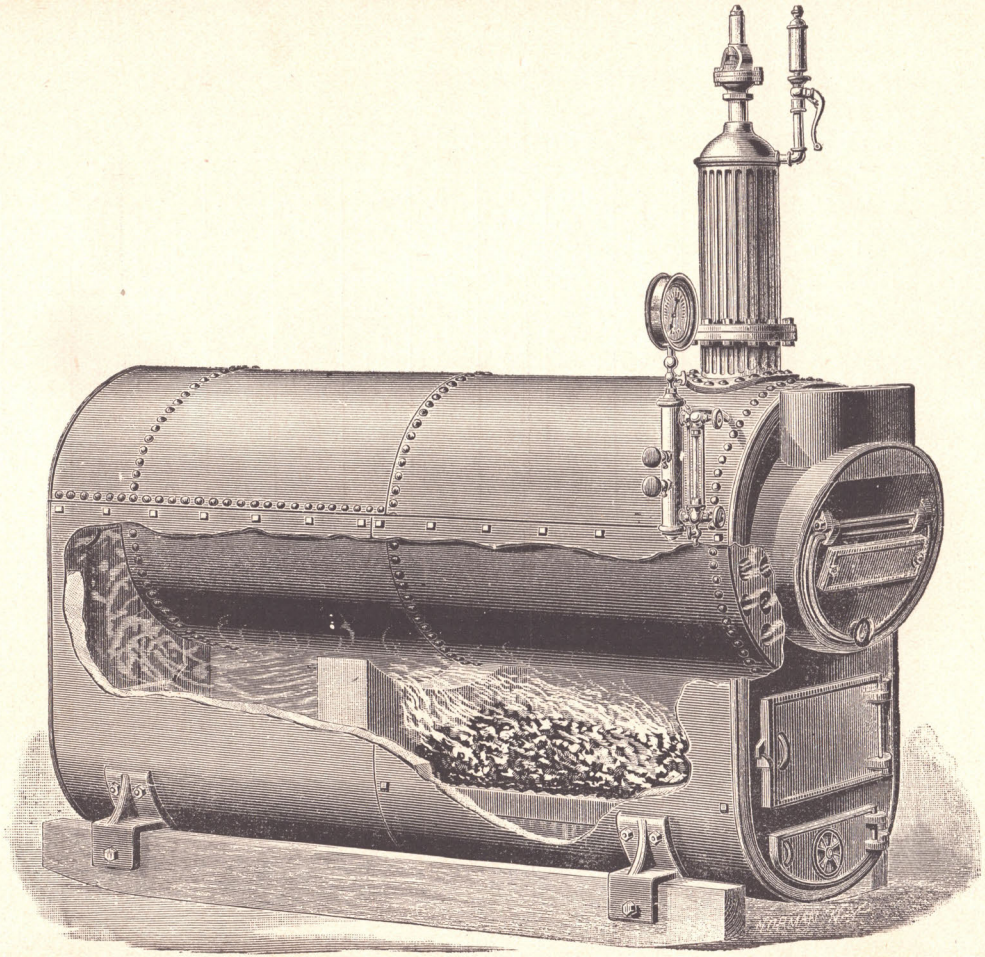
Boilers are made with wrought iron or cast iron domes as may be preferred. All sizes above No. 14 are made with open bottom.

There are a large number of purposes for which the Return Tubular or the Two Flue Boiler are unsuitable, and in many cases a Boiler of the Locomotive type best fills the requirements. Especially is this true in cases where the location is not permanent, and where it may be necessary to move the Boiler from place to place. It is also true in localities where brick or stone setting is difficult or perhaps impossible. It is also true in cases where fuel is not so much an object as the ability to generate steam quickly on short notice. For these and other purposes the Locomotive Boiler will be found available.

The Locomotive Boiler, however, is open to objection on the score of economy. To meet this objection we build the Return Flue Locomotive.

The accompanying cut represents the Return Flue Locomotive Boiler. This style of Boiler combines many of the advantages of the Return Tubular with that of the Locomotive Boiler. By reference to the engraving, it will be seen at once that the products of combustion are carried from the fire box through several large flues to the smoke chamber at the rear of the Boiler; thence back again through smaller flues to the smoke box at the front end. By this means the heat is retained as long as possible in contact with the surface of the Boiler, and the economy of fuel obtained is nearly or quite equal to that of the Return Tubular Boiler. At the same time the Boiler is self-contained, is mounted upon skids, and is as easily moved from place to place as a Locomotive Boiler

These Boilers are complete with all necessary fixtures, including grates, fronts, doors, safety valve steam gauge, water gauge, gauge cocks, whistle and blow-off.



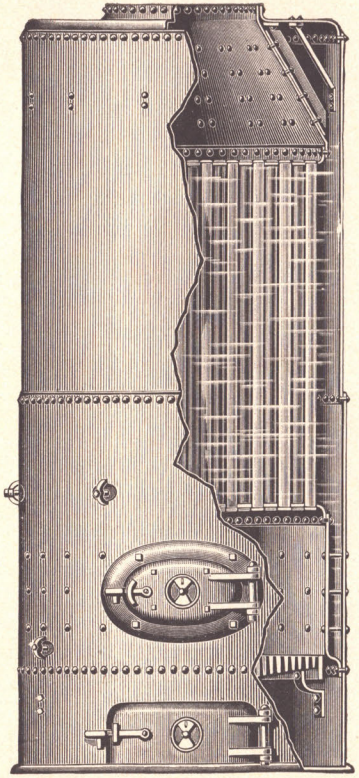
EXCELSIOR BOILER.

DIMENSIONS.

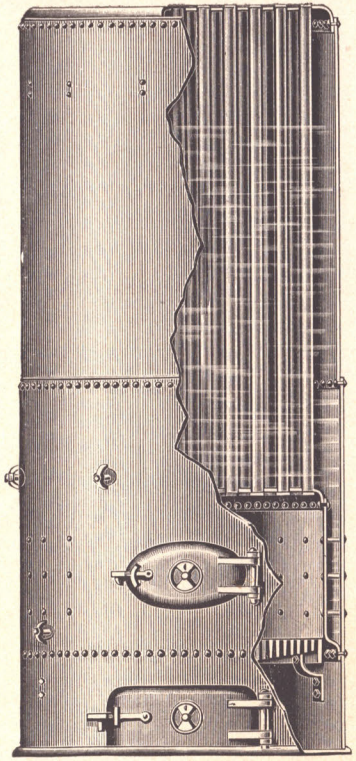
Number	1	2	3	4	5	6	7	8	11
Horse Power	4	5	6	7	8	10	12	15	20
Square Feet Heating Surface	45	60	75	95	114	133	152	186	226
Diameter of Shell	24	24	24	30	30	30	30	34	34
Number of 3-inch Tubes	15	15	15	22	22	22	22	28	28
Length of Tubes ..... feet	3	4	5	5	6	7	8	7	9
Length of Grate Surface	28	32	32	36	36	36	36	48	48
Width of Grate Surface	20	20	20	24	24	24	24	30	30
Thickness of Steel in Shell...No.	4	4	4	4	4	4	4	$\frac{1}{4}$	$\frac{1}{4}$
Thickness of Steel in Head	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$
Size of Smoke Pipe	13	13	13	13	13	13	13	15	15
Length of Smoke Pipe	12	12	12	18	18	18	18	18	18
Thickness of Smoke Pipe	20	20	20	18	18	18	18	16	16
Size Safety Valve	1	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	2
Size Blow-off Valve	1	1	1	1	1	1	1	1	1
Size Feed	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1
Space occupied, Length	59	71	83	83	96	109	123	113	137
Space occupied, Width	31	31	31	36	36	36	36	42	42
Weight Boiler without Fixtures.	985	1175	1350	1920	2140	2380	2620	3080	3730
Weight Fixtures	810	1025	1150	1200	1560	1620	1880	2040	2900

The Excelsior Boiler is well designed for work requiring moderate power in small compass. Price of this Boiler includes fire box shell with full set of fire brick lining, heavy bar grates with adjustable bridge wall, grate rest, fronts, including fire door, ash door and damper, flue doors at the rear end and smoke box with swing door.

Fittings include water column, steam gauge, water gauge, gauge cocks, safety valve, whistle and pipe, blow-off cock, stop valve and check valve.



SUBMERGED TUBE BOILER.



PLAIN VERTICAL BOILER.

PLAIN VERTICAL BOILERS.

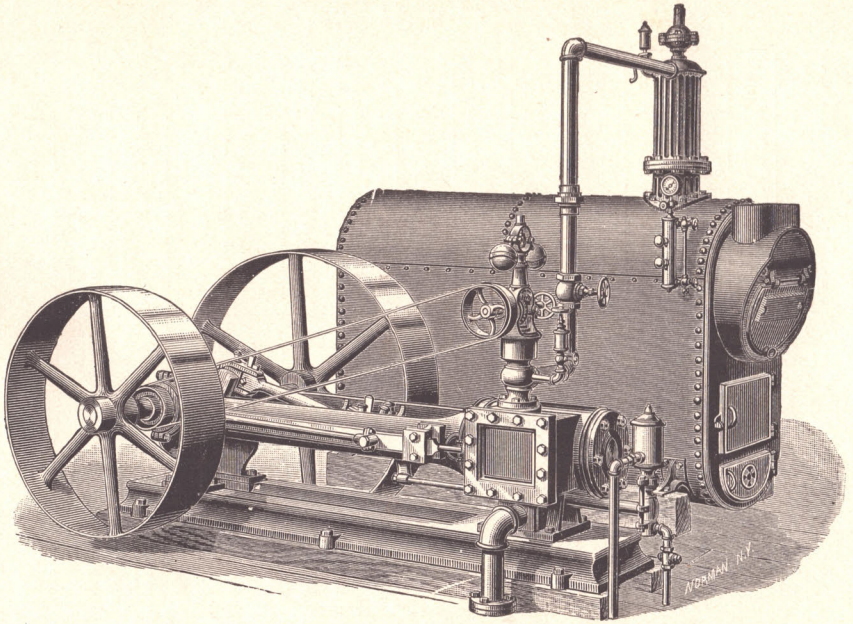
Horse Power.....	4	5	6	8	10	12	13	13	16	18	23	28	35	40	45	50	50	55	60
Diameter.....inches	24	24	24	30	30	30	36	36	36	36	42	42	42	48	48	48	54	54	60
Height..... ...feet	4	5	6	5	6	7	6	6	7	8	8	9	10	9	10	11	10	12	10
Diameter of Fire Box...	20	20	20	25	25	25	31	31	31	31	37	37	37	43	43	43	48	48	55
Height of Fire Box.....	24	24	24	27	27	27	27	27	27	27	30	30	30	33	33	33	31	31	31
Number of 2-inch Tubes	31	31	31	50	50	50	68	68	68	68	88	88	88	124	124	124	150	150	171
Length of Tubes.....	24	36	48	33	45	57	45	45	57	69	66	78	90	75	87	99	89	109	89

Boiler is complete with grates and rest, smoke box hood, steam gauge, safety valve, check valve, blow-off cock, gauge cock and water gauges. All other fixtures extra.

SUBMERGED TUBE VERTICAL BOILERS.

Horse Power.....	25	30	35	40	45	50	60	70	80	100	125	150
Diameter..... .inches	42	42	48	48	48	54	54	60	60	72	72	84
Height..... ..... feet	8	9	9	9½	10	9½	10	11	12	12	13	14½
Diameter of Fire Box, inches	37	37	43	43	43	48	48	54	54	60	60	72
Height of Fire Box .. inches	30	30	30	30	30	30	30	30	30	36	36	40
Height of Cone.....inches	24	24	27	27	27	30	30	30	30	36	36	40
Diameter of Cone Base, inches	40	40	46	46	46	51	51	57	57	64	64	78
Diameter of Cone Top, inches	18	18	22	22	22	24	24	26	26	30	30	36
Number of 2-inch Tubes.....	110	110	146	146	146	194	194	240	240	280	330	500
Length of Tubes.....	42	54	51	57	63	54	66	72	84	72	84	90

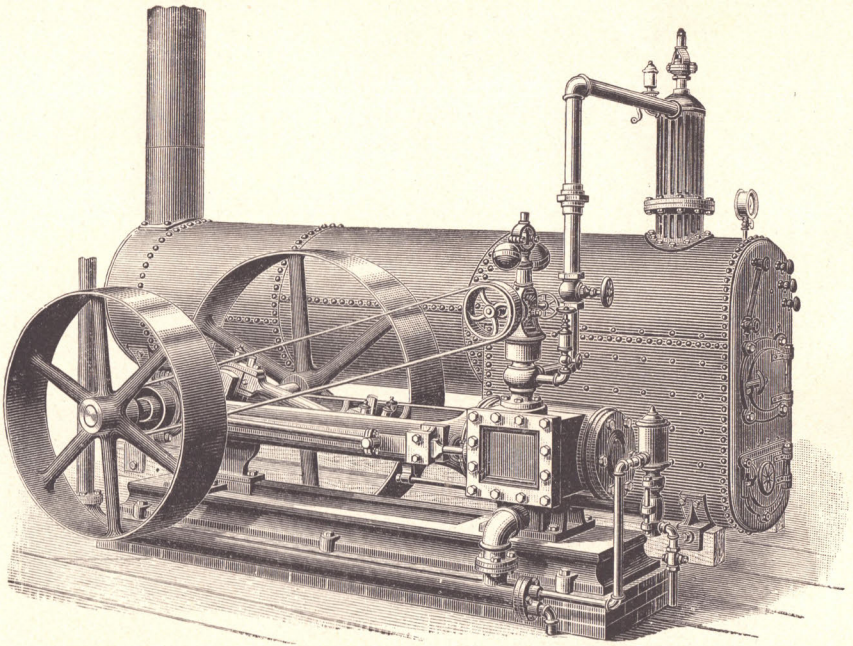
Fixtures include grates, ash pan and doors.
Fittings comprise steam gauge, water gauge, gauge cocks, safety valve, blow-off valve, check valve and stop valve.



The cuts on pages 24 and 25 represent our Excelsior Engine and our Portable Engine detached. That is to say, instead of being placed upon the Boiler, the Engine is set upon a separate foundation at the side, making a Stationary Engine of it.

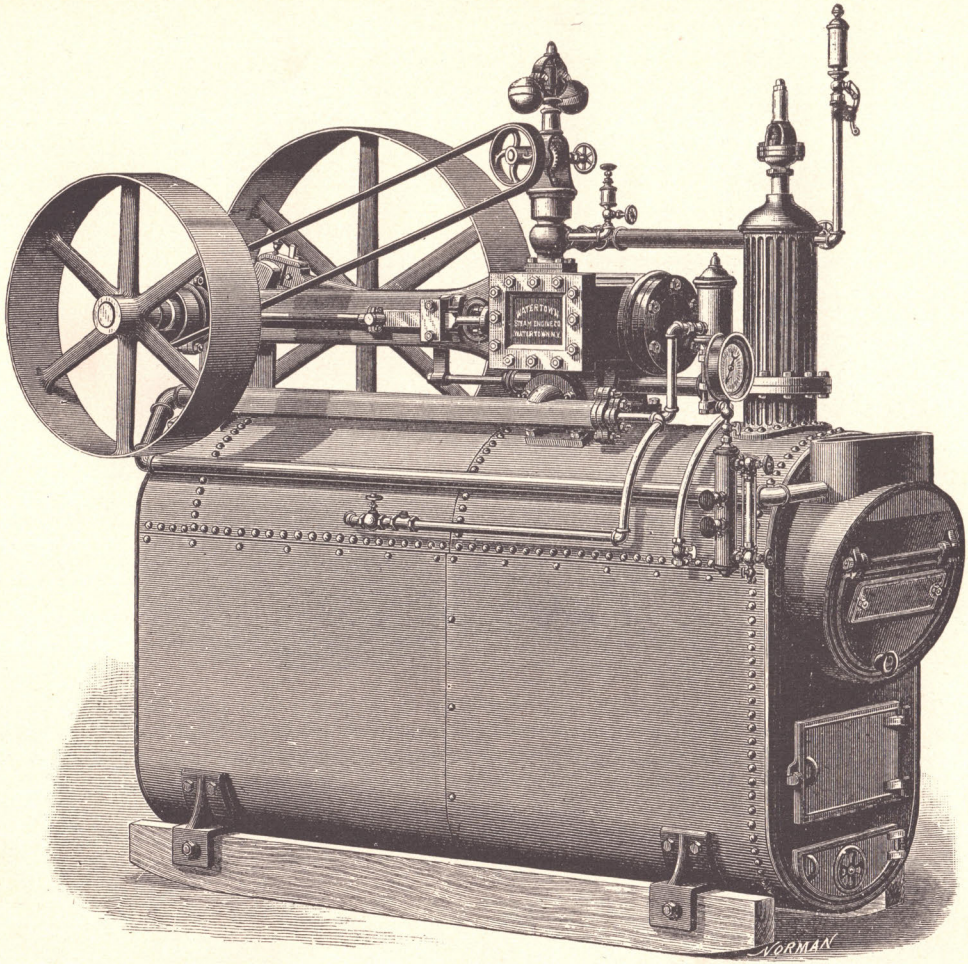
In this case the Engine is identical with the Excelsior or Straight Line Engine as shown on page 2, while the Boiler corresponds in all respects to the Locomotive shown on page 16, or the Excelsior Boiler on page 20.

When Engine and Boiler are furnished detached in this way, we make a small extra charge for the bed plate upon which the Engine is placed, the connecting pipes between Engine and Boiler and the anchor bolts by which the Engine is held to its foundation.



Our Portable and Excelsior Engines have this advantage, that they can be at any time removed from the Boiler and put upon a separate foundation, or if first set up as a detached Engine it is always possible to put the Engine on the Boiler if desired.

One of the advantages which we claim for these Engines when mounted upon the Boiler is the central position of the Engine. The strain from its working is received by the Boiler in the direct line of its greatest strength, entirely avoiding the cross or diagonal strain on the riveted seams to which the side-saddle Engines are exposed. The connecting rod takes hold of the center of a double crank shaft with wide bearings on either side. The main shaft carries two pulleys, balancing the weight and permitting the Engine to drive two machines at the same time without a countershaft.

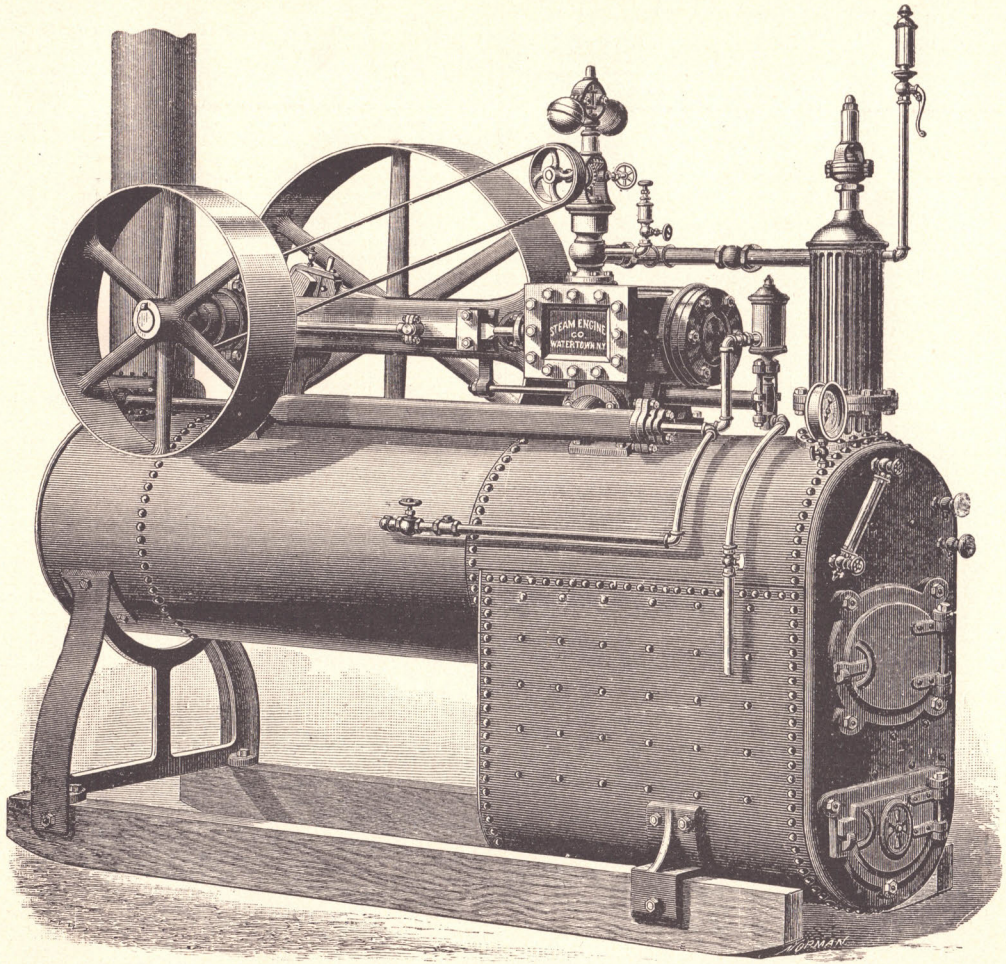

NORMAN

THE EXCELSIOR ENGINE.

DIMENSIONS.

Number	1	2	3	4	5	6	7	8	11
Horse Power	4	5	6	7	8	10	12	15	20
Diameter of Cylinder	4	5	5	5½	6	6½	7	8	9
Stroke	6	6	8	9	9	10	10	12	12
Revolutions per Minute	240	240	240	240	240	225	225	200	200
Diameter of Fly Wheel..inches	26	30	30	36	36	40	44	48	54
Face of Fly Wheel.....inches	4	6	6	8	8	8	8	12	12
Diameter of Pulley.. inches	16	20	20	24	24	24	24	30	36
Width Face of Pulley...inches	4	6	6	8	8	8	8	8	8
Diameter of Boiler.....inches	24	24	24	30	30	30	30	34	34
Length over all. . ... inches	59	71	83	83	96	109	123	113	137
Length of Fire Box.....inches	28	32	32	36	36	36	36	48	48
Width of Fire Box.....inches	20	20	20	24	24	24	24	30	30
Number of Tubes.....	15	15	15	22	22	22	22	28	28
Length of Tubes.....inches	36	48	60	60	72	84	96	84	108
Diameter of Tubes.....inches	3	3	3	3	3	3	3	3	3
Weight, Engine and Boiler ...	2300	2600	3000	3700	4500	5700	6200	7600	9500

This Engine is complete with all parts necessary to its successful operation; including, for the Boiler, fronts, doors, grates, smoke-pipe, steam gauge, water gauge, gauge cocks, safety valve, stop valve, check valve, blow-off and whistle; and, for the Engine, double crank shaft, fly-wheel, pulley, automatic stop governor, throttle valve, air cocks, cylinder lubricator, oil cups, pump, heater and a full set of wrenches.


STEAM ENGINE
CO
WATERTOWN NY

THE PORTABLE ENGINE.

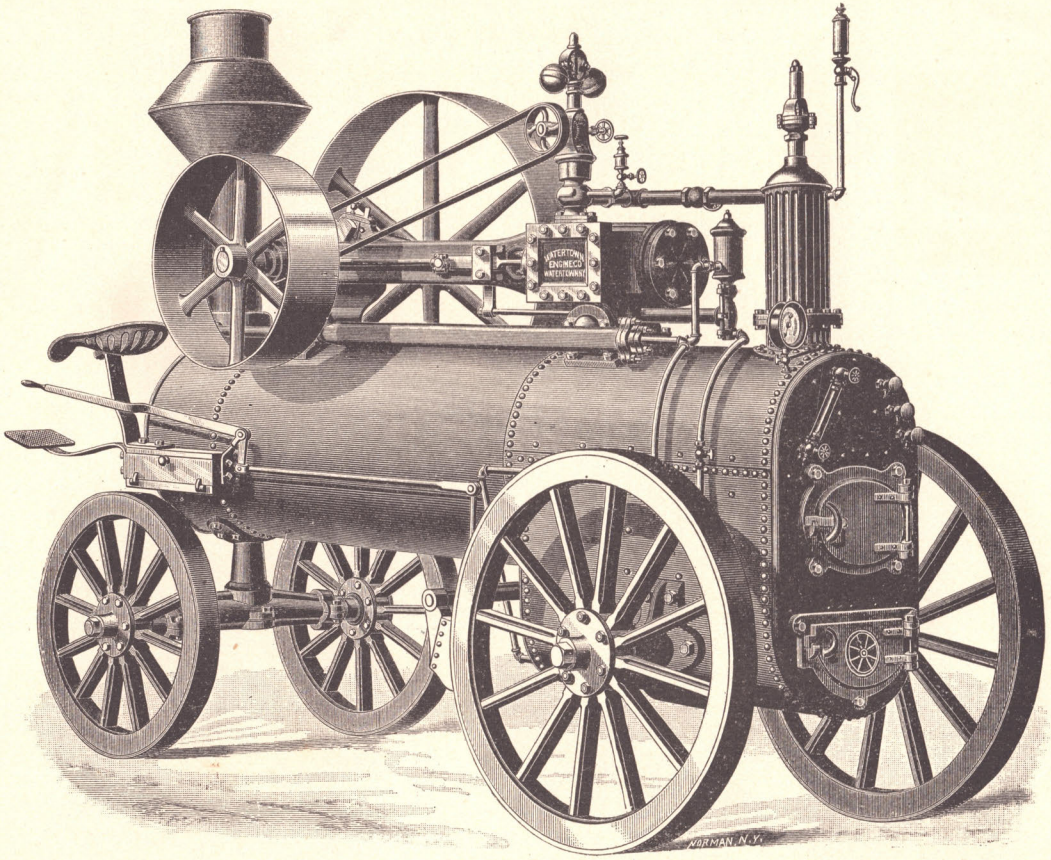
DIMENSIONS.

Number	3	4	5	6	7	8	11	14	16	18	20
Horse Power	6	7	8	10	12	15	20	25	30	35	45
Diameter of Cylinder...inches	5	5½	6	6½	7	8	9	10	11	12	12
Length of Stroke.....inches	8	9	9	10	10	12	12	14	14	14	14
Diameter of Fly-Wheel, inches	30	36	36	40	44	48	54	60	60	66	66
Face of Fly-Wheel.....inches	6	8	8	8	8	12	12	12	12	13	13
Diameter of Pulley.....inches	20	24	24	24	24	30	36	40	40	48	48
Width Face of Pulley.. inches	6	8	8	8	8	8	8	10	10	12	12
Revolutions per Minute.....	240	240	240	225	225	200	200	180	180	160	180
Length of Fire Box.....inches	30	36	36	36	36	40	49	55	55	60	60
Width of Fire Box.....inches	18	20	20	22	22	26	28	30	30	30	35
Height of Fire Box.....inches	24	29	29	34	34	36	38	40	40	40	46
Diameter of Waist.....inches	22	24	24	27	27	30	33	36	36	36	42
Number of Tubes.....	23	26	26	32	32	32	36	43	43	43	41
Diameter of Tubes.....inches	2	2	2	2	2	2½	2½	2½	2½	2½	3
Length of Tubes.....inches	48	48	60	60	72	78	84	84	96	108	120
Weight.....	2800	3500	3700	5000	5150	6700	7500	10300	11000	11500	12500

The Portable Engine shown on the opposite page has long been the standard for a large variety of uses and will undoubtedly continue to be so.

The Engine as shown is complete with double crank shaft, fly wheel, pulley, automatic stop governor, throttle valve, air cocks, cylinder lubricator, oil cups, pump, heater and a full set of wrenches.

The Boiler is complete with all the usual fixtures, including doors, grates, smoke pipe, steam gauge, water gauge, gauge cocks, safety valve, stop valve, check valve, blow-off and whistle.


WATERTOWN
ENGINE CO
WATERTOWN
NORMAN, N.Y.

THE AGRICULTURAL ENGINE.

DIMENSIONS.

Number	3	4	5	6	7	8	11	14
Horse Power	6	7	8	10	12	15	20	25
Diameter of Cylinder....inches	5	5½	6	6½	7	8	9	10
Length of Stroke ....inches	8	9	9	10	10	12	12	14
Diameter of Fly Wheel.inches	30	36	36	40	44	48	54	60
Face of Fly Wheel.....inches	6	8	8	8	8	12	12	12
Diameter of Pulley.. .. inches	20	24	24	24	24	30	36	40
Width Face of Pulley...inches	6	8	8	8	8	8	8	10
Revolutions per Minute	240	240	240	225	225	200	200	180
Length of Fire Box.....inches	30	36	36	36	36	40	49	55
Width of Fire Box.....inches	18	20	20	22	22	26	28	30
Height of Fire Box.....inches	24	29	29	34	34	36	38	40
Diameter of Waist.....inches	22	24	24	27	27	30	33	36
Number of Tubes.....	23	26	26	32	32	32	36	43
Diameter of Tubes.....inches	2	2	2	2	2	2½	2½	2½
Length of Tubes .....inches	48	48	60	60	72	78	84	84
Weight.....	3600	4500	4700	6000	6200	7800	9000	10500

The Agricultural Engine shown on the opposite page is the same in all respects as the Portable Engine, with the addition of the wheels upon which it is mounted, the driver's seat and step, special tool box, neck yoke, whiffletrees, neap, brake and locomotive smoke pipe. The wheels upon which the Engine is mounted may be either iron or wood. Unless otherwise specified, however, we shall furnish iron wheels for sizes below No. 7, and wooden wheels for No. 7 and larger Engines.

On size No. 3 we do not furnish a brake unless specially ordered, at an extra price. The Engines are complete with all the parts furnished with the Portable Engine, with the addition of combination pipe wrench, flue scraper and fire tools.

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PRINTERS AND BINDERS
CHICAGO